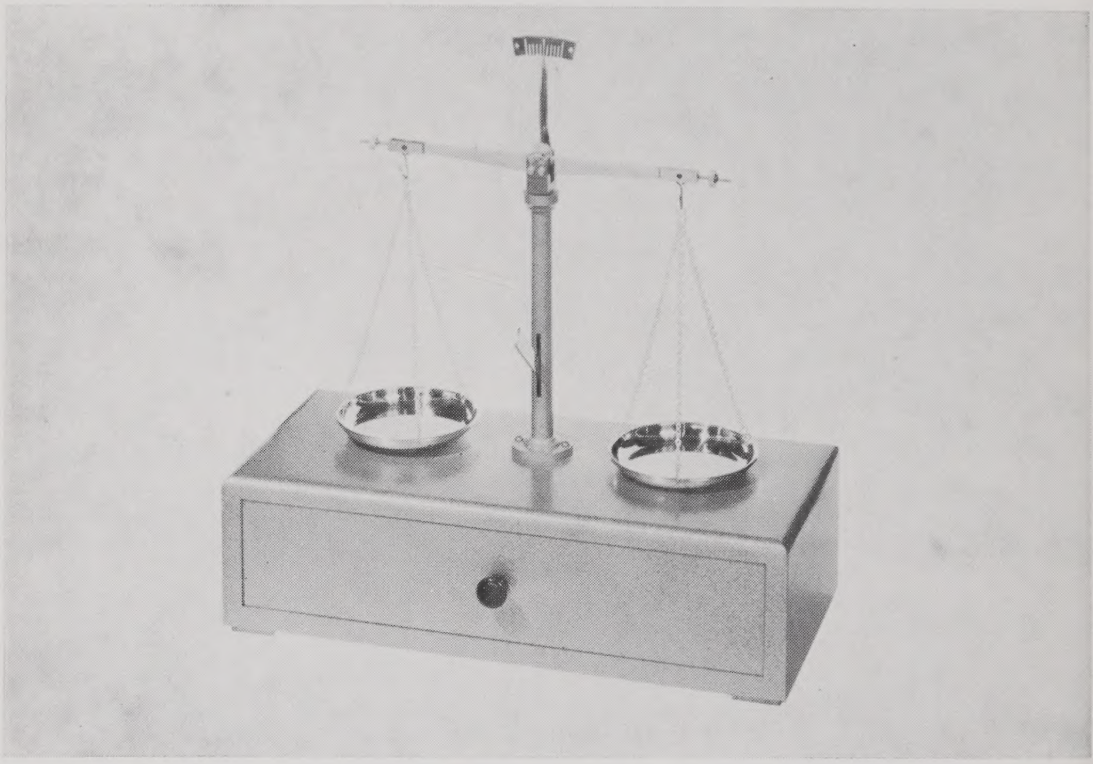
Vol. VI. No. 6 June, 1967

NORTH AMERICAN JOURNAL OF NUMISMATICS

THE TURTLE

PRECISION COIN SCALES



Brass precision scales, mounted on wooden box with drawer for weights. Beam and pans are nickel-plated, knife edges and bearings are hardened steel, pans are suspended from silver plated chains. Complete set of metric or Troy weights included, in wooden block.

$40.00 complete, postpaid and insured

Please allow 4-6 weeks for delivery.
For airmail add $2.00 postage.

Extra set of weights — $5.00

A complete line of precision pocket and hand scales also available from $20.00 to $30.00

Details upon request

ARGONAUT INC.

Merchandise Division

737 N. Michigan Ave. Chicago, Illinois 60611

THE TURTLE

NORTH AMERICAN JOURNAL OF NUMISMATICS

A PUBLICATION OF THE ANCIENT COIN CLUB OF AMERICA

VOL. VI, NO. 6 JUNE, 1967

In This Issue

From the Editor's Desk *163*

Parthian Numismatics *165*
By FURDOONJEE D. J. PARUCK

A Hybrid Denarius of Septimius Severus *179*
By WILFRED WILSON LYON

How Accurate Are X-Ray Fluorescence Analyses of Ancient Copper Coins? *181*
By GILES F. CARTER

Treatment of Leather Bookbinding *191*
By C. E. ROWE

The Numismatic Exchange *192*

Cover Coin; As of Hadrian (117-138).
Photo courtesy of Herb Brabandt.

Copyright © 1967 by Argonaut, Inc., Publishers. All rights reserved.

Published monthly by Argonaut, Inc., Publishers, 737 North Michigan Avenue, Chicago, Illinois 60611. Address editorial mail to the Editor: John E. Hartmann, 5107 39th Avenue South, Minneapolis, Minnesota 55417. Address subscription and advertising mail to 737 North Michigan Avenue. Chicago, Illinois 60611. Lewis Henry, Business Manager. Subscription: $4.00 per year (12 issues). Abroad: $5.00. Single copies: $0.50. Second Class Postage paid at Chicago, Illinois.

CHARLES A. SAUNDERS

Box 116, Island Park New York 11558

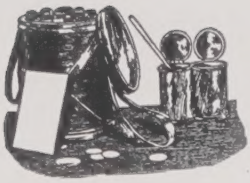
TEL.: (516) 431-6412

Ancient Coins • Objects of Art • Ancient Artifacts

All coins and antiquities are guaranteed authentic and satisfaction is guaranteed. One week return privilege.

For illustrations of some of my antiquities for sale, see the May, 1966 "Turtle" double page ad in the center fold.

1. Syria. Tetradrachm Demetrius I. (162-150 BC) VF+ $60.00; F $50.00
2. Alexander the Great (336-323 BC) Tetradrachm. Larissa Mint, Syria. VF+ 68.00
3. ———. Tetradrachm. VF+/VF, small encrustation on edge, .. 60.00
4. ———. Fine/F, dark and some discoloration. Sharp reverse, ... 45.00
5. Parthia. Mithradates II (123-88 BC). Drachm. FDC with original mint luster. Superb 35.00
6. ———. Phraates IV (37-2 BC). Drachm. XF 25.00
7. ———. Phraates IV. Tetradrachm. G/fair $28.00; Fair..... 23.00
8. ———. Mithradates IV. Drachm. XF 10.00
9. Omayyads. Dirhim, Wasait mint. (84-130 AD) XF $7.50; F 3.50
10. Sassanian Empire. Khustro II (591-628 AD) Dirhim. VF 4.00
11. Tabaristan. Afzoud (8th c. AD) Dirhim. F-VF 4.50
12. Elymais. 2nd-3rd c. AD. Bronze drachm. F-VF $3.50; G-VG 2.50
13. Ceylon. 1100-1200 AD. Bronze messa. VF-XF 2.00
14. Serbia. Vukasin (1368-71 AD) Bronze gros. Unusual. Arabic legend/bust of Christ. Ratto #2686. VG 7.50
15. Persia. 1500-1800 AD. Various sizes, shapes. Fully attributed F-VF each $2.50. 5 diff. $10.50. 10 diff. 19.50



From the Editor's Desk

Upon occasion the phrase, "recorded history" is used. This refers to a period which commenced roughly some five thousand years ago, from which we have our earliest remaining written records. These records are clay tablets in cuneiform script and are archives of the ancient Sumerian culture of Mesopotamia. Many of these texts are "economic," that is, they detail transactions regarding land transferences, government receipts and so forth.

The significant facet of these earliest documents is that they demonstrate an advanced and complete monetary system — one where silver, by weight, performed the functions which economists usually attribute to money. It is quite apparent that silver, by weight, is a standard of value since all other quantities of both metal, including gold, and commodities are reduced to their silver value. It is also apparent that silver, by weight, is serving as a medium of exchange and since silver must be an unrestricted circulating media, it must also act as a store of value.

One can not assume that such a monetary system suddenly appeared in full bloom. There must have been centuries over which this system developed and for which no records survive. The use of silver as a monetary metal precedes the "dawn of written history."

No one has ever theorized satisfactorily on why silver should have represented money to men over these many millenia. Gold has always had more value — through perhaps gold has always been too scarce to serve as a money metal. Perhaps it is simply that silver was scarce enough to be of value, yet plentiful enough to serve a monetary function and durable enough not to deteriorate if held for a long period.

When men began to coin money it is perhaps only natural that the metal chosen was one which best served such a function and was already time honored by use. Although we have ample specimens of electrum and gold from antiquity, and following the time of Alexander, a fully developed bronze subsidiary coinage system — nevertheless, the coinage metal of antiquity was silver and the huge bulk of ancient coins are of

that metal. The Romans used a standard silver coin, a nummus, for at least five centuries until they were finally forced by a silver shortage in the fourth century AD to adopt a gold nummus. It is interesting to note that even though gold held sway as a coinage metal during the middle ages, the return of silver to some degree of abundance in the fifteenth century brought an almost immediate abandonment of gold in favor of silver as a monetary metal.

The introduction of coinage introduced a new factor in the world's monetary systems, the idea of fiat coinage. It has to be apparent that a coin must have value on its face that exceeds its metal value — if it does not, there is no profit to coining and moreover the coin is threatened with the melting pot. The twenty-seven centuries which have passed since coining first began have seen a gradual acceptance by people of a coin which possesses less and less value in metal.

Silver, which has served men for over five millenia, now is being recruited to new uses, ones of which the highest civilizations of antiquity could never have dreamed. Photography and electronics and the projects which aim at the conquest of space all have placed inordinate demands upon a metal which heretofore has served only to grace a fine table, serve as a base for jewelry and been the basis of mankind's money.

At a time when silver can no longer serve men as money, men have finally come to accept that the basis of their economic systems is not metal, but rather their own capacity and potential to produce what they require in terms of goods and services. Money to twentieth century man is then merely a token regardless of whether it is paper, copper, nickel or silver.

The needs of the modern industrial machine require silver for new uses and the year 1967 will perhaps see almost the last of silver coins in circulation. There ought to be a twinge at least of nostalgia upon the part of the historically minded as they see the metal which has served men as money for thousands of years divorced finally and forever from the world's monetary system. Still, the metal which has served so well will continue to do so and it will play its part in the coming years when the race of men moves toward unheard of horizons.

To the numismatist, an old drachma or denarius will become an ever more treasured artifact of the days of man's past when silver had far less sophisticated used than those to which it is now about to be put.

JOHN E. HARTMANN, EDITOR

Parthian Numismatics

By Furdoonjee D. J. Paruck[1]

I.

Parthian numismatics[2] have been made the subject of study by some well-known numismatists since the celebrated Vaillant whose *Arsacidarum Imperium sive regum Parthorum historia ad fidem numismatum accommodata,* was published posthumously in 1725. Eckhel, who had before him the researches of Froelich and Pellerin, was able in the third volume of his *Doctrina* (1794) to improve greatly upon the attributions of Vaillant, and paved the way for the meritorious investigations of Visconti, Lenormant, Bartholomaei and Lindsay.

The four works (much use of which has been made in this paper) now most commonly consulted by numismatists are:—*Memoirs sur la chronologie et iconographie des rois parthes Arsacids,* Paris, 1853 (the 18 engraved plates were not published until 1882) by Longperier; *Les monnaies des rois Parthes,* Paris, 1874-75 (with 6 plates) by Prokesch-Osten; *The Parthian Coinage,* London, 1877 (with 8 plates) by Gardner; and *Catalogue of the Coins of Parthia in the British Museum,* London, 1903 (with 37 plates) by Wroth.[3]

Longperier's work deals with a portion of the Arsacid series of coins but contains some valuable historical dissertations. Prokesch-Osten's book describes the coins in his own fine collection, now in the Berlin Museum. Gardner's work is distinguished for its clearness of arrangement and sober judgment. Little has been written on Parthian numismatics, with the important exception of De Markoff's *Coins of the Arsacidae* (text in Russian), which appeared in the *Journal of the Russian Oriental Society,* St. Petersburg, 1892. Drouin has given a very able summary and review of this paper in the *Revue Numismatique,* part I, 1893. Rapson (*Numismatic Chronicle,* 1893, pp. 203-219) has also reviewed it but from points of view other than those already occupied by Drouin. Wroth has come to the conclusion that some modifications must be made in the accepted arrangement of the coins as set forth in Gardner's work. The rectifications that seemed necessary are principally in the period before Phraates IV (B.C. 38/37-3/2) and in a paper *On the Re-arrangement of Parthian Coinage* published in the *Numismatic Chronicle* for 1900 (pp. 181-202) he has criticized the existing arrangement. He has indicated an alternate scheme, which with various modifications and corrections, has been adopted in the *British Museum Catalogue.* Papers by

Drouin and Reinach, and De Markoff's *Monnaies des Rois Parthes*, Paris, 1877, should be mentioned. A bibliography of Parthian numismatics is given by De Markoff in his *Catalogue des Monnaies arsacids* (Institut des Langues orientales), St. Petersburg, 1889, p. III sq. Some account of a correspondence between Six and Marquardt, the orientalist, on the re-arrangement of Parthian coins, is given in Holwerda's *Levensbericht van Jan Pieter Six*, Amsterdam, 1902, p. 43 sq. (reprinted from the *Jaarboek der Koninklijke Akadamie van Wetenschappen*, 1902.)

The only consecutive history of the earlier Arsacid kings is the meagre narrative of Justinus, who frequently contradicts both himself and the author, Trogus Pompeius, whom he professes to abridge. Of the later Arsacid kings there is no consecutive history in existence. Moses of Choren occasionally gives us a useful hint. Arabic and Persian writers probably had no means of ascertaining the truth as to the events of the Parthian period. There are scarcely, except coins, any certain historical monuments of Parthian times. Setting aside the rock sculpture of Gotarzes and the ruins of Hatra, there is scarcely a stone or brick in Asia which bears witness to Parthian handiwork. Inscriptions there are next to none Even in the case of the coins, their value as historical evidence is very much diminished by the fact that hardly any, until the close of the first century of the Christian era, bear any name but the generic name of Arsaces. But the coins almost invariably give portraits, and, after the reign of Orodes I (B. C. 57-37), the tetradrachms bear dates, so that their testimony is after all of great value. And as far as it goes, it is beyond dispute. The historian is bound to prefer the testimony of a single undoubtedly genuine coin to the statements of any writer.

Rawlinson's *Sixth Oriental Monarchy*, London, 1873, and Gutschmid's *Geschichte Irans*, Tübingen, 1881 (edited by Nöldeke), the two chief modern histories of Parthia, are well known. Rawlinson's is a painstaking and very readable account of Parthian history and geography. Gutschmid's treatise is highly-condensed, but none the less a most informing work. His article 'Persia' in the *Encyclopaedia Britannica*, 9th edition, is an abridged translation of this. An useful compendium of Parthian history by Justi is to be found in Geiger and Kuhn's *Grundriss der Iranischen Philologie*, vol. II, p. 480 sq. There is a chapter on Parthia, in Mommsen's *Provinces of the Roman Empire*, vol. II, chap. IX (Eng. trans.). For the geography of Parthia, see Geiger in *Grundriss der Iranischen Philologie*, vol. II, p. 391 sq.

II.

Parthia was a strip of country some hundreds of miles east of the southern extremity of the Caspian Sea, inhabited by a hardy and enterprizing race of Scythic origin. Of the history of this district little is known. Few dates are harder to fix from the testimony of the ancient writers than that of the Parthian revolt. Justin appears to declare for either B. C. 256 or 250, and it is to the latter date that Rawlinson inclines. A fortunate discovery of George Smith (*Assyrian Discoveries*, 1875, p. 389) has given a satisfactory solution of the question. He found a record which proved that the Parthians made use of an era of which the 144th year corresponded to the 208th of the Seleucid era, and which therefore must date from B. C. 249/48. This positive evidence overrides the authority of contending historians. The Seleucid era dates from the autumn of B. C. 312. It is probable then that B. C. 249/48 was the year, if not of the first revolt of Arsaces, at least of the dawn of success on his endeavour. He seems to have been the chief of a band of Scythians, who dwelt near the Ochus, and were a branch of the Parnian Dahae. They rose against the satrap of Antiochus II, Theos, and rescued Parthia from the Macedonian yoke, Arsaces becoming the first king. Gutschmid and other recent writers doubt whether Arsaces was ever actually king of Parthia. His reign was, at any rate, very brief, and the practical foundation of the kingdom must be attributed to his brother, Tiridates I, who reigned for nearly forty years probably from B. C. 248/47 to 211/10.

The only Parthian sculpture is a record of the victory of Gotarzes (A.C. 40/41—51) over Meherdates in A.C. 49. This sculpture is cut on some rocks at Behistun right upon figures which date from the reign of Darius Hystaspes, and obliterating them. It consists of a king on horseback, with lance couched, galloping in pursuit of a wild animal, while Victory hovers above him and places a wreath on his head. Behind him gallops a smaller horseman. Above is a much mutilated inscription, which is still further destroyed by having an arch or doorway cut through the middle of it (see Flandin et Coste, *Perse Ancienne*, pl. XIX). Sir Henry Rawlinson, (*Journal of the Royal Geographical Society*, vol. IX, p. 114) who visited the spot in 1847, read the inscription thus: ALPHA SATES MITHRATES PEP . . . GOTARZES SATRAPES TON SATRAP . . . and further found below the words GOTARZES GEOPOTHROS. It will be seen from the very careful drawing of Flandin that not all the letters by Rawlinson are now

A SELECTION FROM OUR PRESENT STOCK

1. **MARC ANTONY,** AR den. Antony as a priest, Rev. Radiate head of Sol, C#13, F/VF..... $29.75
2. **MARC ANTONY,** AR den. Head of Antony, Rev. Head of Octavian, VG-F some flat spots, Scarce..... $23.00
3. **OCTAVIAN,** 42 BC AR den. Rev. Victory advancing rgt. L. LIVINEIVS REGULUS Moneyor, **fourre** VF-EF..... $25.00
4. **AUGUSTUS** 27BC-AD14, AR den. Rev: Legend in Oak Wreath sharp. Very Fine, large flan. Choice! $35.00
6. **AUGUSTUS,** AR den. Rev: Caius & Lucius stg. shield between them, Fine to Very Fine..... $21.50
7. **TIBERIUS,** AE As, Legend around large SC, struck 10-11 AD, Rome Mint, nice portrait, Very Fine..... $17.00
8. **CALIGULA** 37-41 AD, AR den. Rev. Radiate head of Augustus, star in field, Fine, slight roughness in fd..... $90.00
9. **CLAUDIUS** 41-54 AD AR den. Rev. Agrippina, nice portraits quite a rare coin and moderately priced at only.....$115.00
10. **NERO** 54-68 AD, AR den. Rev: Roma seated left, VF+/VF choice portrait, a rare reverse type..... $77.00
11. **GALBA AD** 68, AR den. Rev: Salus, nice VF, RARE..... $75.00
12. **DOMITIAN** 81-96 AD AR den: Rev: Minerva EF+ nice.... $20.00
13. **PERTINAX** AD 193 AR den. Rev: Aequitas standing to the left, choice portrait, VF and sharp, RARE.....$198.00
14. **CLODIUS ALBINUS** 195-197 AD, AR den. Rev. Roma seated to the left. Fine/Fine+, Scarce, nice portrait $26.00
15. **CARACALLA** AR den. Rev. Roma, nearly FDC, Sharp..... $15.00
16. **CARACALLA** AR **ANTONINIANUS,** Rev: Jupiter stg. EF/VF a well struck piece of nice silver content..... $16.00
17. **BALBINUS** AD 238, AR den. Rev. Victory, nice VF, excellent portrait, ruled 98 days, RARE..... $65.00
18. **MARIUS** AD 268, AE ant. Rev: Felicity, EF but little actual wear, nice color, ruled 2-3 days, RARE..... $32.50
19. **FLORIANUS** AD 276, AE ant. Rev. Victory and Florianus standing, EF, little wear, ruled 2 months..... $27.50
20. **CARAUSIUS** 287-293 AE ant. Rev: Pax standing, rev. slightly off-center, Choice EF, Scarce..... $16.00
21. **ALLECTUS** 293-296 AD, AE ant. Rev: Pax standing, FDC with beautiful, patination, London Mint $29.50

CLASSICAL ARTS

P.O. Box 8082 Gentilly Station New Orleans, La.

All coins are sent AIR MAIL POSTPAID. All it takes is a postcard to be put on our mailing list. No subscription or stamps required. Write for our free, illustrated price lists now. We are in the market to buy your Fine or better ancients. Presently we have a larg stock of Roman and Greek. Your want list will be kept on file and coins will be shipped on approval for your convenience. We hope to be able to send you our future listings.

visible. So far as I am aware, no one has yet succeeded in translating this inscription.

Most of the Parthian kings are usually spoken of by writers as Arsaces, and it can scarcely be wondered that this fact has led to some of them being confused together or entirely overlooked. The confusion probably arises from the fact that every king of Parthia bore, besides his particular name, the general one of Arsaces, just as the kings of Egypt bore the name of Ptolemaeus, and the emperors of Rome the name Caesar. All the Parthian kings save Orodes I (B. C. 57-37) and Gotarzes (A. C. 40/41—51), until we reach the time of Pacorus II (A. C. 77/78—109/110), used on their coins only the dynastic name of Arsaces. The kings took this name from veneration for the founder. They did not use their particular name on their coins perhaps because they issued coins in a purely official capacity. But towards the end of the first century of the Christian era, the Parthian monarchy began to be split up among rival princes, each of whom claimed to be the true representative of the Arsacid line. It was then that the custom arose for each monarch, in addition to the name of Arsaces, to place his more particular name upon some of his coins. For a considerable time after the introduction of this custom it is the tetradrachms only which display the innovation, the drachms still reproducing in their blundered legend the dynastic title only. When this change does reach the drachms, the name which is found on them is in every case written, not in Greek, but in Pahlavi characters — a sign that the Greek tongue was no longer understood by the people.

The epithets and titles by which the Arsacid monarch distinguish themselves are very varied. The rude conquerors, having no civilization of their own, nor even a language at all suited to the intricacies of civilized life, adopted the Greek language and culture which they found already introduced. In the variety of the legends, particularly in their increasing length and the number of titles they comprise, we find the key to the arrangement of the coins before Phraates IV (B.C. 38/37—3/2). The name of the first king is given simply as ARSAKOY, the second styles himself BASILEOS ARSAKOY, the third adopts the style of BASILEOS MEGALOY ARSAKOY and so on. The titles increase till the full royal style is fixed. The drachms of Phraates IV present what may be called the stereotyped Parthian legend, for it is seen on nearly all the succeeding coinages:— BASILEOS BASILEON ARSAKOY EVERGETOY DIKAIOY EPIPHNOYS PHILELLENOS "The king of kings, Arsaces, the benefactor,

NUMISMATIC REVIEW

No. 1, 1967

The first issue of the Numismatic Review for 1967 was mailed to our regular subscribers early in June.

CONTENTS

Articles

To The Collector — The Editor
Copies of Russian Silver Rubles — The Editor
More About the Russian Platinum Fakes
Harry M. Severin, March 12, 1967
Roman Religion and the Republican Coinage
— Dr. Charles Schwarzenberg

Ancient Coins

Ancient Greek Silver Coins
Roman Republican Denarii
Roman Imperatorial and Imperial Coins

Medieval and Modern Coins

Italian Minor Coins 13th — 17th Century
European Talers 16th to 20th Century
German Crowns Since 1800
Italian Crowns and Minor Coins
Russian Coins
Coins of Asia, Africa and the Pacific
Orders and Decorations
Medals of the Hapsburgs

A sample copy will be sent to interested collectors upon request.

Coin Galleries

Hotel Salisbury, 2nd Floor

123 West 57th Street **New York, N. Y. 10019**

the just, the (divine) manifestation, the friend of Greece." The title BASILEUS BASILEON "king of kings" occurs for the first time in the Parthian series on some of the coins of Mithradates II (B. C. 123-88). It represents, as Drouin has remarked (*Sur l'origine du titre royal* BASILEUS BASILEON in *La Gazette Numismatique*, Bruxelles, 1899) the *khshayathiya khshayathiyanam* "king of kings" of the Achaemenid kings. This has been the title of Persian kings from the most ancient times. The great Cuneiform inscription at Behistun commences:—*Adam Darayavaush khshayathiya vazraka khshayathiya khshayathiyanam* "I am Darius, the great king, the king of kings" (see *The inscription of Darius the Great at Behistun*, British Museum, 1907, p. 1, lines 1-2). Some of the later Parthian drachms bear a legend in Pahlavi. The first two letters of his name in this language occur on the coins of Volagases I (A.C. 52-77/78), and from Mithradates IV (A. C. 130—147) the names of the kings in full appear with the title *malka* "king." This and the barbarous legends indicate that the Greek tongue was no longer understood by the people.

The costume of the first Arsaces is strongly characteristic. He wears a conical helmet not unlike that of the Assyrians, with flaps to protect ears and neck, and bound with the regal diadema of the Greeks; his ears are adorned with earrings, and his neck with a torquis of the simplest form. He is clad in a coat of mail, apparently consisting of scale or chain armour, which covers his arm to the wrist, and his legs to the ankle; over this is thrown a short military cloak or sagum. His shoes are fastened by straps or thongs round the ankles. This dress, which suited a rude leader of nomads, rather than an Asiatic king of kings, was soon abandoned by the successors of Arsaces. In place of the rude armour a soft under-garment is worn, and an over-garment shaped like a cloak, open at the neck, having sleeves, and adorned apparently with several rows of gems. How the lower part of the body is dressed we cannot tell, as we have no full-length representations of them. Some of them wear either the Parthian helmet or the simple diadema. On the coins of Phraates IV and his successors we find frequent full-length portraits of kings, and always in the same costume, which is quite different alike from their predecessors. The king now wears a soft under-garment, over which is a short jacket, open at the neck, and there adorned with rows of braid, and tied in at the waist by a girdle. His legs are clad in trousers, full above and tight below. It is curious to compare this regal costume with that of the Parthian subject on the coins of Artabanus III (A.C. 10/11—40). The chief difference

between the two is that the jacket of the subject is much longer, as well as less adorned, reaching far below the hips. The loose trousers are common to master and subject. Chosroes (A.C. 106/107-130) and Volagases IV (A.C. 191-207/08), among the later kings, introduced a striking innovation. With the exception of these two, all the Parthian kings seem to have worn their hair long, and hanging in natural waves. But these two kings adopted the fashion of dressing their hair into bunches of curls, on either side of the head, or behind it. There can be little doubt that this was a Persian, not a Parthian fashion, for it is very usual on the coins of the Sasanian kings.

The dress of women is less frequently represented on coins. Musa, the wife of Phraates IV, wears a lofty tiara, adorned with gems, and bound with the Syrian diadema; over her shoulders is a rich mantle, open, like her husband's, at the neck. The female figures which occur on the reverse of later tetradrachms, being intended to represent Greek cities, are clad, in Greek fashion, in long chiton and himation. The dress of the true Parthian woman may have been different: that of the queens is, as we have seen.

The manners and customs of the Parthians were derived from three distinct sources. They always retained much that derived from their Scythian ancestors: but at the same time they inherited many of the traditions of the Persian and Assyrian races, which had been paramount for centuries in Asia. With these habits mingled others of Greek origin, brought into Asia by the soldiers of Alexander, and maintained there by the cities which he founded. Of all three sets of customs we find traces on the coins. That the king sometimes appears on horseback, and that his favorite weapon is the bow, point clearly to a Scythian source. On the other hand, the scenes in which the monarch, seated, receives gifts and marks of honour from his subjects, are clearly late copies of those reliefs of Assyrian times, of which so many still remain. Of Greek influence the signs are still commoner. The Greek diadema is the type of kingship: the Greek wreath is the reward of valour of merit. All the titles of the monarchs are Greek, and the era by which time is reckoned is the era of the Seleucid.

Especially in the indications of Parthian religion do we find a blending of three distinct strains. The Scythian stock has never been noted for fervent attachment to any creed, and seems in early times, from the statements of Herodotus, to have been almost destitute of a creed. Such religion as the Parthians possessed, over and above the veneration for their

national hero and his family, they adopted from the Persians. Of this we are sure from numerous statements of the historians, but we find extremely few traces of the Persian cult on coins. On the coins, indeed, commonly called sub-Parthian, and issued, in Parthian times, by the satraps of the great king, the fire-altar is a usual type. Nike and Tyche are two beings or classes of beings, the creation of Greek imagination, which are especially common on the Parthian coin. There appears to be some ground for supposing that the worship of some Greek deities was officially recognized by the Parthians, and perhaps mingled by them with their other religion.

Persia proper had long been a province of the Parthian dominions; but, like Media and other provinces, had been governed by kings of its own, subject only to a tribute and a Parthian garrison. Ardashir raised about A.C. 220, the banner of revolt against the barbarian conquerors in the name of the ancient lineage and religion of Persia. The decisive engagement with Ardavan (Artabanus) in which the last Parthian monarch fell, and where Ardashir I gained the title of "king of kings," seems to have been on 28th April (A.C. 224, according to Nöldeke, or A. C. 227, according to Gutschmid), and was probably fought in Babylonia or Susiana. Thus, the sceptre of the East passed from Parthian into Persian hands. A tetradrachm in the French collection, published by Longperier (p. 157, pl. XVIII), dated year 539 = A.C. 227-28, with the name Artavasdes, perhaps a son of Artabanus, or a Parthian patriot in a yet unconquered corner of the East, furnishes the evidence of the remnant of Parthian royalty after the final overthrow by Ardashir I, the founder of the Sasanian empire. This is the last monument of Parthia.

III.

The coinage of the Parthian rule forms a very extensive series spreading over a period of nearly four hundred and seventy-five years from about B. C. 250 to about A.C. 227. The arrangement of this coinage is well known to present exceptional difficulties. In the first place, the personal name of the sovereign is, as a rule, not recorded upon the coins. But difficulties arise, perhaps even to a greater extent, from the fact that the literary material for reconstructing the history of Parthia is always scanty and frequently untrustworthy. Even after the researches of Rawlinson and Gutschmid we cannot compile with certainty the list of Parthian monarchs or determine with precision the limits of their reigns. It must not be assumed that the kings followed one another in natural sequence, because allowances have to be made for the possibility

IMPORTANT ANNOUNCEMENT

Available in late June we will have for sale the reprint edition of Frederic W. Madden's

HISTORY OF JEWISH COINAGE
and
MONEY IN THE OLD AND NEW TESTAMENT

This mid-nineteenth century corpus is truly one of the greatest contributions to Numismatics of Biblical times.

It includes:

- **350 pages beautifully bound**
- **254 coins illustrated throughout the text**
- **A foldout plate of alphabets**
- **One complete chapter devoted to weights of Jewish coins**
- **Complete indexing**

This reprint book of the famous first edition is offered for $12.00 plus 50c handling, postage and insurance.

(California residents please add 4% sales tax.)

Be sure to order your copy today from

specialist in classical numismatics

JOEL L. MALTER

Mail Address: P. O. BOX 777 VENICE, CALIFORNIA

of contemporaneous reigns as well as the rise of usurpers and rival rulers. The dated coins bear testimony to these facts, unrecorded or vaguely hinted at by the historians. In the present state of our knowledge, no classification, however plausible it may seem on purely numismatic grounds, can have any valid pretensions to finality.

There are no known gold coins of Parthia. Any gold coin that may have been in use among the subjects for purposes of trade during the continuance of the Parthian empire must have been foreign money. The denominations in silver are:—tetradrachm, drachm, triobol, diobol and obol. De Markoff (*Coins of the Arsacidae*, St. Petersburg, 1892, text in Russian) gives a long excursus on weight standards, which is stated here as briefly as possible. He sees evidence to show that, in Parthian currency, the Attic drachm of rather light weight—4.20 grammes=65 grains—was gradually supplanted by the Phoenician drachm of 3.73 grammes=58 grains, or rather less. The Phoenician standard was introduced into the Seleucid coinage in the reign of Alexander Bala and lasted till the time of Antiochus IX, when it fell into disuse. In Parthia it began to be used in the reigns of Phraates I and Mithradates II, and gradually superseded the Attic standard. This victory of the lighter standard is explained by De Markoff from the fact that during the century before and two centuries after Christ, the Parthian drachm and the Roman denarius constituted almost the sole currency of this part of Asia. The denarius struck for Asiatic circulation gradually degenerated in quality and weight, and the drachm, its rival, was obliged to move in the same direction.

The tetradrachm was first struck in the period of Mithradates I (B.C. 171-133). The weight of the earlier tetradrachms ranges from about 240 to 250 grains. From the time of Phraates IV there is a diminution in the weight and a considerable deterioration in the quality of the silver. The tetradrachms of Phraates IV himself vary a good deal (about 220-228 grains). Those of his successors weigh from about 210 to 225 grains, but many specimens weigh less than 200 grains.

The quality of the silver of the drachms remains good almost throughout the coinage, and the weight of well-preserved specimens in the earlier reigns, till Orodes I (B. C. 57-37) inclusive, does not fall below 60 grains, and may be approximately stated to range from 60 to 67 grains. The drachm of Phraates IV weighs from about 57 to 61 grains. From this reign, in fact, till the fall of the Arsacid kingdom, the drachm (with very

ANCIENT ARTS

We specialize in the coins of ancient Greece, Rome, Egypt, Medieval Europe, Africa, Asia, etc.

In addition to coins, we sell genuine Artifacts, Jewelry, Pottery, etc. of these ancient lands.
A sample copy of our price list is free for the asking. Please write.

BRUCE B. BRAUN

P.O. Box 2728
Amherst Sta.

Buffalo, New York — 14226

BUY AND SELL THROUGH THE ACCA AUCTION

The ACCA auction is held quarterly — in January, April, July and October. Entries close the last day of the month preceding the auction and bids close the last day of the auction month.

Have you coins to sell?
Send them with your reserve price to

HAROLD ROEPE, Auctioneer
2003 Grand Blvd.
Cedar Falls, Iowa 50613

rare exceptions) never again attains the weight of 60 grains.

The triobol (27 grains) is found only in the reign of Phraates III (B.C. 70-57). The diobol occurs in the "beardless head" series (15 grains), and also under Orodes I (19.5 grains). The obol though not extant in large numbers, was probably fairly common. It was minted in the early reigns till Phraates II (B. C.138-128/27) inclusive, and recurs under Orodes I. In the period of Mithradates I (B.C. 171-138) its weight varies from 9 to 11.3 grains; under Orodes 1, 9.7 grains.

The denomination or normal value of the bronze pieces are not known.

The most important part of the inscriptions on coins are the dates. Some of the bronze coins from the reign of Phraates IV onwards tell us in what year they were issued. The tetradrachms of the same princes give us still more precise information. For on them we find recorded not the year of issue only, but also the month. Before this time they occur rarely and sporadically. The drachms are never dated. It has already been stated that the era used by the Parthians in dating is that of the Seleucid: the months used being those of the Macedonian Calendar. The year consisted sometimes of twelve, sometimes of thirteen months. The length of the year was regulated, not by the sun, but by the moon. The months are:—Dius Apellaeus, Audynaeus, Peritius, Dystrus, Xanthicus, Artemisius, Daesius, Panemus, Lous, Gorpiaeus, Hyperberetaeus and Embolimus. The place in the year assigned to the intercalary month (Embolimus) is not known, but the most convenient hypothesis seems to be to assume that it was at the end of the year. An intercalary month was inserted at intervals in order to bring back the months to their proper season. The first month, Dius, is variously reckoned by modern writers as equivalent to August, September or October, but it is probably safest to regard Dius as identical with October because the autumnal equinox (about which time the Macedonian year began) is nearer 1st October than 1st September, and it is thus likely that in the majority of years the greater part of Dius fell in October, not in September.

The obverse of the coins represents the king's head in profile turned to the left, except in the period of Mithradates I and on the tetradrachms before Mithradates II. The head is represented completely facing on coins of the unknown king (B.C. 57) and Artabanus III (A.C. 10/11-40). Vardanes II (A.C. 55) and Volagases IV (A.C. 191–207/08) also appear full face. The head of a queen is seen in the person of Musa

(*continued on page* 188)

WHOLESALE ONLY

SUPPLIER OF ANCIENT SYRO-ROMAN GLASS, COINS, TERRA-COTA, JEWELRY, BRONZE, ETC. STATE YOUR INTEREST AND SEND YOUR WANT-LIST.

SELIM HADDAD

P.O. BOX 2615 BEIRUT, LEBANON

SEABY'S COIN AND MEDAL BULLETIN

A monthly magazine and pricelist for the collector listing numerous ancient coins.

ANNUAL SUBSCRIPTION $2.00

B. A. SEABY LTD.

61-65 GREAT PORTLAND STREET
LONDON, W. 1, ENGLAND

SPRING SPECIALS

1. **CALIGULA,** Sest. Obv: Pietas seated. Rv: Caligula sacrificing. Obv. legend readable. C 11. A RARE coin but badly cleaned corroded, condition poor, hence only ..... $ 9.00
2. **DOMITIAN,** Den. Rv: Minerva. C. 280 Nice portrait -VF/F+ .. 11.00
3. **HADRIAN,** Sest. SCARCE Rv: Hadrian as Emperor receiving sceptre from eagle-excellent early portrait but cleaned F/G... 8.50
4. **ANTONINUS PIUS,** Den. Rv: Cos IIII Equity standing C. 240 High relief and strong, pleasing portrait VF+/VF 10.00
5. **ANTONINUS PIUS,** As. Rv: Pax. Almost Fine 4.50
6. **COMMODUS,** Sest. Rv: Felicitas C. 907 Very pleasing portrait, patinated, thick flan. Nearly Very Fine 17.50
7. **MAXIMUS,** Sest. C. 3 VERY SCARCE. Patinated. Thick flan. -F/VG+ 20.00
8. **GORDIAN III,** Sest. Rv: Apollo seated left. SCARCE type. Nearly F 5.50
9. **PHILIP I,** Ant. C. 124 Well centered, nice portrait. VF/EF ... 6.00
10. **ALLECTUS,** Ant. Rv: Aeqvitas Avg. Patinated. M&S 63. RARE. Fine ++ 25.00

All coins are guaranteed genuine. Cheerful refund made for any reason within 7 day period. Some postage appreciated. Same day service is my policy. Conservative grading. Watch for another listing in next month's TURTLE. Fla. residents please add tax.

A.N.A. **J. B. POWELL** A.C.C.A.

P.O. Box 5086, Lighthouse Point Station
Pompano Beach, Florida 33064

A Hybrid Denarius of Septimius Severus

WILFRED WILSON LYON

The subject coin[1] was in a small collection purchased recently. It had not been attributed and due to the unattractive flaking of the silver plating was possibly a candidate for the "spare" box.

Sep. Severus denarius (fourrè) axis
206 A.D. 3.28 grams sp. gr. 9.08

←

→

Obverse: IULIA AUGUSTA. Bust draped right.
Reverse: PMTRPXIIIICOSIIIPP.

Annona stdg. left holding corn ears and cornucopia at feet left. modius

This coin is not listed among the hybrids mentioned in M&S RIC Vol. 4 Pt. 1. As a footnote to the title "HYBRIDS" page 172, M & S say "probably in the main ancient forgeries."

That the coin is fourrè (used in the sense of a heavy coating of silver rather than a "wash") is scarcely to be considered in deciding whether the coin is the work of contemporary counterfeiters or a product of an official mint.[2]

We know that plated coins were not uncommon. Both punch and die are well cut. The obverse shows the same sensitive treatment of the Empress' features as usual.

We must assume that the moneyers of the period were not exempt from the pressures of quotas and deadlines. The armies must be paid: the production norms must be met. If normal reverse punches were used up before the required output was achieved, what could be more natural than to use a current reverse punch of the Emperor?

To assume that counterfeiters did not know the difference

between one punch and another or the effect the wrong punch on a coin would have on a merchant or money changer is rather underrating the intelligence of a man who depended on his cunning to stay alive.

[1] Photos are twice the actual size.

[2] Mattingly, H.: Sydenham, A., *The Roman imperial coinage.* London 1923 —. Vol. I, p. 35.

COINS OF THE CRUSADERS

Princes of Antioch

Bohemund III, 1162-1201 AD. Silver denier. Bust r./Cross. VF $4.50
Bohemund IV, 1201-32 AD. Silver denier. Armored bust r./Cross. VF.. 4.50
Raymond of Poitiers, 1136-49 AD. Silver denier. Bust r./Cross. Rare. F to VF 8.50

Princes of Achaia

Isabelle of Villehardouin, 1297-1301 AD. Billon denier Tournois of Clarentia. Scarce. Crude, F..... 6.50
Philip of Tarent, 1307-13 AD. Billon denier Tournois of Clarentia. Crude but rare. F 5.50
Jean D'Anjou-Gravina, 1318-33 AD. Billon denier Tournois of Clarentia. Rare. Crude, F 7.50

All coins are guaranteed genuine. Ohioans please add 3% sales tax.

I specialize in ancient Roman and Greek, early English, and medieval and early modern coins. And I need the choice and key coins of these series. Let me know what you have to sell.

Convention Schedule: Coop, Cincinnati, July 14-16; Northeast Ohio, Cleveland, July 21-23; and the 76th Annual A. N. A. Convention, Miami Beach, Aug. 8-12.

C. H. WOLFE

(ANA — ANS — ACCA — FRNS — RCDA — Etc.)

P. O. Box 222 **Lakeside, Ohio 43440**

SUPPORT THE ACCA AUCTION

How Accurate Are X-Ray Fluorescence Analyses of Ancient Copper Coins?

GILES F. CARTER

X-ray fluorescence analysis has been shown to be an essentially nondestructive method for analyzing ancient coins.[1-5] However, the X-rays which are involved in these analyses are very weak and are absorbed by as little as 0.0002″ of copper. This means that in X-ray fluorescence only a thin surface layer of metal is analyzed. Obviously accurate analyses may be obtained only when the surface layer has the same composition as that of the interior of the coin.

When ancient coins are corroded by moisture and air or dirt, oxides form on the surface of the coin. These oxides have a different composition from the metal in the coin not only because oxygen is present, but also because certain elements are enriched or depleted in the oxide. Consequently X-ray fluorescence analysis of coins coated with an oxide, or patina, leads to inaccurate results.

If the oxides are removed, say by an electrochemical method which does not attack the underlying metal, the surface of the coin still has a composition somewhat different from the interior. E. T. Hall, who was probably the first to analyze coins using X-ray fluorescence, discovered this effect of depletion or enrichment of elements at oxide-free surfaces of Roman coins.[6] Hall warned that X-ray fluorescence would likely give insecure analyses of ancient coins.

In previous work,[1,3] I showed that there is a way around the problem of depletion or enrichment of certain elements at the surface of coins. The solution to this problem comprises removing about a thousandth of an inch of metal from the surface of the coin by either of two techniques. The coin may be electropolished to produce the desired result, or it may be abraded in an air stream containing fine aluminum oxide powder. This latter treatment is the preferred method since it leaves the coin with a dull, matte finish. Prior to the aluminum oxide treatment, oxide deposits should be removed from the coin surfaces by electro-chemical means (cathodic treating for several minutes in hot, dilute sodium carbonate solution). This cleaning and abrading technique does not damage, dissolve, or noticeably wear down the metal coin. In fact, the details of ancient coins are often heightened by this treatment. X-ray fluorescence is an essentially nondestructive method and is useful for analyzing all ancient coins except

those having a desirable patina.[7]

Previous work[1,3] has shown that the surfaces of ancient coins prepared in the above manner have essentially the same compositions as the interiors of the coins. This was demonstrated by analyzing a group of cleaned coins using X-ray fluorescence. Then these coins were filed down to expose the interior of each coin. X-ray fluorescence analysis of the field surfaces showed the interior of each coin to have essentially the same composition as its surface.

Nearly 250 Roman copper coins have now been analyzed by X-ray fluorescence, and it is concluded from these analyses, most of which are unpublished, that information can be obtained in the following areas: (1) most Roman coins may be dated within 25 to 50 years; (2) composition groupings may be made in some series (e.g. the altar series struck at Lugdunum); (3) unidentifiably worn or corroded coins may be approximately dated; (4) composition may be correlated with mint sites; (5) in special cases it should be possible to determine the ore sources; (6) some of the technology of producing coinage metals may be deduced; (7) counterfeits may be detected; and (8) certain economic policies and relationships may be deduced (e.g. beginning very abruptly in about 265 A.D. *all* Roman copper coins had 3 to 5% silver added to them).

In a review of a previous paper by the author,[4] Hartmann remarked in effect that it would be highly desirable to determine the accuracy of the X-ray fluorescence method of analysis.[8] This was a reasonable statement in view of Hall's warnings about X-ray fluorescence analysis of ancient coins. The present work was undertaken partly in response to Hartmann's criticism.

In order to obtain accurate X-ray fluorescence analyses of metals it is necessary to have standard metals of known compositions which approximate the composition of the unknown. In my work eleven National Bureau of Standards copper alloys of certified composition have been used. In addition I prepared six copper alloys approximating the compositions of Roman copper coins. After these latter alloys were shown to be homogeneous, four of them were analyzed by commercial analysts using wet chemistry. The compositions of these standards were also determined using X-ray fluorescence and the National Bureau of Standards alloys and pure metals wherever possible. Results shown in Table 1 demonstrate that X-ray fluorescence is capable of analyzing metal alloys with good

accuracy: to plus or minus one part in ten for most determinations greater than 0.1%.

However, coin surfaces are not smooth, and it is known that roughness of surfaces can lead to inaccurate X-ray fluorescence analyses. Also surface depletion or enrichment is a possible source of inaccuracy. Inhomogeneities in the coinage metal are a further potential source of inaccuracy. Corrosion products may penetrate into grain boundaries (junctures of small crystals which are present in all coins).

The inaccuracy due to roughness can be largely corrected for all practical purposes by adjusting the sum of the concentrations of the elements present to 100%. Surface depletion may be avoided by removing about a thousandth of an inch from the surface of the coin by the aluminum oxide treatment. In the analyses of both the obverse and reverse of 250 Roman copper coins, very nearly the same composition for obverse and reverse of each was obtained in more than 98% of the coins; inhomogeneity on the scale that affects the accuracy of X-ray fluorescence analysis is rare. Since X-ray fluorescence analyzes an area about $^3/_8$ inch in diameter, inhomogeneities must be fairly large[9] to affect the analysis: normally inhomogeneities of this magnitude are found only in the case of zinc in orichalcum (brass) coins. This is a consequence of the way the Romans made orichalcum: zinc ore was reduced in the presence of copper. Zinc diffused into the copper without being separated as pure zinc, and at times the diffusion was not uniform in all parts of the system, leading to inhomogeneities that were not always removed by melting the brass coinage metal. Finally most corrosion products in grain boundaries are likely removed during preparation of the coin for analysis. Since grain boundaries are very thin, only a small amount of corrosion product would be present compared to the amount of uncorroded metal. In general few copper coins appear to suffer from this type of corrosion.

From the above it is concluded that one should obtain fairly accurate analyses by X-ray fluorescence for coins prepared and analyzed using proper techniques. Table 2 compares the analyses of two sestertii analyzed first by x-ray fluorescence and then by a commercial analyst using wet chemistry. X-ray fluorescence analyses of these two coins are accurate to at

MISCELLANEOUS ROMAN SILVER

1. **POMPEY THE GREAT,** 38-36 B.C. Denarius. Lighthouse of Messana. Rv. Scylla. VF $100.00
2. **JULIUS CAESAR. Denarius,** str. by P. Sepullius Macer, c. 44 B.C. Rv. Venus Victrix. VF, corner of rv. lightly struck $200.00
3. .....Similar but less good portrait $150.00
4. .....Denarius str. by L. Mussidius Longue. Rv. Cornucopiae on globe, etc. VF, rv. off center $125.00
5. **M. ANTONIUS,** L. Plancus Proconsul. Denarius. Lituus & capis. Rv. Capis between thunderbolt & caduceus. VF, rare. $125.00
6. **TIBERIUS. Denarius.** Rv. Livia seated. THE TRIBUTE PENNY. F $25.00, F-VF ..... $ 37.00
7. **CALIGULA & AGRIPPINA.** Tetradrachm str. at Antioch. VF $100.00
8. **CLAUDIUS. Denarius.** Rv. SPQR PP OB CS. F-VF $120.00
9. **CLAUDIUS & AGRIPPINA.** Denarius. VF-EF but defect on Claudius's Adam's apple $250.00
10. **NERO.** Alexandrian tetradrachm. Year 10. Alexandria. F-VF. ..... $ 17.00
11. .....Apollo bust. F-VF ..... $ 17.00
12. .....Year 10. Serapis bust. F-VF ..... $ 15.00
13. **VITELLIUS.** Denarius. Victory. EF, choice portrait. $200.00
14. **VESPASIAN.** Denarius str. at Ephesus. PACI ORB PERP AUG, very rare $100.00
15. .....Vespasian as Pax. F-VF ..... $ 10.00
16. Pax. F ..... $ 5.00
17. Anona. F ..... $ 7.00
18. Fortuna Redux. F ..... $ 8.00
19. **DOMITIAN.** Denarius. Minerva. F-VF $10.00, VF-EF $ 15.00
20. .....Double denarius (didrachm). Rv. Athena. VF $ 15.00
21. **DOMITIA, WIFE OF DOMITIAN.** Tetradrachm. Rv. Venus Victrix. VF $125.00

We issue quarterly the HESPERIA ART BULLETIN, a profusely illustrated catalog of selections from our stock of ancient coins and Greek and Roman antiquities. Subscription: two dollars for four issues. Trial copy sent free on request.

HESPERIA ART

Antiquities

GREEK - ROMAN - NEAR EASTERN

Ancient Coins

2219 St. James Place **Philadelphia, Pa. 19103**

least one part in five to ten, except for concentrations less than 0.1%, where the accuracy is one part in two to five. This assumes that the wet chemical analyses themselves are close to the true values. The wet chemical determination for tin in the Hadrian sestertius is suspect because the value obtained by X-ray fluorescence has been repeated several times.

A pertinent question is "How accurate do analyses of ancient coins need to be to enable useful conclusions to be drawn?" Concentrations of various elements in Roman coins were fixed by the amounts of elements added to the coinage metal (such as tin, lead, zinc, or silver) or impurities inadvertently picked up either from the ore or during smelting (iron, cobalt, nickel, arsenic, antimony, or the above elements when present in concentrations less than one percent). Extremely accurate analyses, say one part in fifty, are unnecessary because of the day to day variation in composition due to inconsistency of addition of metals or to variations in impurities in the ore.

Table 3 presents the ranges of concentrations for the most important elements in Roman copper coins. Judging from the broad concentration ranges obtained for most elements, knowing the concentrations to plus or minus one part in ten, as is true for most X-ray fluorescence analyses when elements are present in concentrations greater than 0.1%, is adequate for drawing conclusions such as those mentioned early in this paper. Hence increasing the accuracy of analysis is unlikely to enable very many more conclusions to be drawn from the analyses.

Lead is particularly difficult to determine accurately in concentrations greater than 5% for the following reasons: it is depleted at the coin surface in such a way that more than a thousandth of an inch of metal should be removed to obtain moderate accuracy, and absorption effects are great, necessitating the use of several standards. Consequently the accuracy of lead determinations may be less than one part in ten for concentrations greater than 5%.

In conclusion X-ray fluorescence of ancient coins is a practical, essentially nondestructive method for obtaining moderately accurate analyses. The present accuracy of about one part in ten is sufficient to enable many useful conclusions to be drawn from X-ray fluorescence analyses of ancient coins. X-ray fluorescence should be of great value because the method is rapid and may be used on thousands of coins in fair to poor condition.

(*continued next page*)

Table 1. Analysis of Standard Copper Alloys

Element	Alloy #1 W C[a]	Alloy #1 XRF[b]	Alloy #3 W C[a]	Alloy #3 XRF	Alloy #5 W C[a]	Alloy #5 XRF	Alloy #6 W C[f]	Alloy #6 XRF
Iron	0.01	0.01	0.17	0.17	0.007	0.018	0.18	0.16
Cobalt	0.067	0.067[c]	0.014	0.005	0.017	0.016	0.004	0.005
Nickel	0.14	0.17	0.03	0.03	0.05	0.06	0.035	0.04
Copper	[d]	78.6	[d]	95.7	[d]	95.2	97.06	97.0
Zinc	[d]	[d]	3.38	3.44	[d]	[d]	1.26	1.36
Lead	17.1	15.5	0.05	0.04	0.93	0.85	0.10	0.11
Arsenic	0.67	0.67[c]	[d]	[d]	ND[e]	0	[d]	[d]
Silver	0.09	0.13	0.10	0.06	1.99	1.99[c]	0.02	0.03
Antimony	1.40	1.4[c]	0.04	0.04	0.08	0.10	[d]	0.15
Tin	3.17	3.36	0.04	0.02	1.75	1.65	0.95	0.95[c]

[a] Analyzed by commercial analyst A. All numbers are in weight percent. W C is Wet Chemistry.
[b] XRF is X-Ray Fluorescence.
[c] This specimen is the standard used for other x-ray fluorescence analyses because National Bureau of Standards copper alloys having this approximate concentration of the given element are unavailable.
[d] Not determined. In the case of zinc or arsenic, none was present.
[e] ND is None Detected (less than 0.01%).
[f] Analyzed by commercial analyst B.

Table 2. Analysis of Roman Sestertii

Element	Vespasian W C[a]	Vespasian XRF[b]	Hadrian W C[a]	Hadrian XRF
Iron	0.19	0.15	0.23	0.16
Cobalt	0.01	ND[c]	0.01	0.005
Nickel	0.02	0.017	0.01	0.02
Copper	[d]	81.5	[d]	85.1
Zinc	18.0	17.8	14.9	14.0
Lead	0.17	0.18	0.35	0.36
Silver	0.06	0.06	0.06	0.04
Antimony	0.07	0.05	0.11	0.10
Tin	0.10	0.08	0.12	0.05

[a] Analyzed by commercial analyst A. All numbers are in weight percent. W C is Wet Chemistry.
[b] XRF is X-Ray Fluorescence.
[c] ND is None Detected (less than 0.01%).
[d] Not determined.

CORRECTION: The following changes should be made in the article "An Unpublished Tetradrachm of Alexander the Great" by David B. Hardy, Vol. VI, No. 5, pp. 147 ff. Page 147, line 25, read fig. 3; line 28, read fig. 2. Page 148, line 2, read BASILEUS (in Greek); line 3, read ALEXANDROY (in Greek).

Table 3.

Concentration Ranges for the Most Important Elements in Roman Copper Coins*

Element	Concentration Range, Wt. Percent
Iron	0.01 to 0.45
Cobalt	0 to 0.19
Nickel	0 to 1.1
Copper	65 to 99.5
Zinc	0 to 22
Antimony	0.01 to 3
Tin	
Silver	0.01 to 7
Arsenic	0 to 2.4
Lead	0.01 to 30

*Minted in Rome from 200 B.C. to 380 A.D.

NOTES

1 G. F. Carter, "X-Ray Fluorescence Analysis of Roman Coins, *Analytical Chemistry* 36, 1264-8 (1964).

2 G. F. Carter and W. H. Carter, "Chemical Analysis of a Plautia Denarius," *Seaby's Coin asd Medal Bulletin*, February (1965).

3 G. F. Carter, "Preparation of Ancient Coins for Accurate X-Ray Fluorescence Analysis," *Archaeometry* 7, 106-113 (1964).

4 G. F. Carter "Analysis of Copper and Brass Coins of the Early Roman Empire," *Science* 151, 196-7 (1966).

5 G. F. Carter, "Ancient Coins as Records of the Past," *Chemistry* 39, 14-19, November (1966).

6 E. T. Hall, "Surface Enrichment of Buried Metals," *Archaeometry* 4, 62-64 (1961).

7 Coin collectors should be aware that "desirable patinas" may be artifically formed by chemical means.

8 J. E. Hartmann, Review of Reference 4, *The Voice of the Turtle* V, 119-121 (1966).
Occasionally a contamination of one side of a coin is found, possibly caused by an embedded particle of slag or scale, but usually this is easily spotted. When this occurse, the determination for the uncontaminated side of the coin is the reported value.

COINS of the

URTUKI TURKUMANS

Stanley Lane-Poole

A reprint of this scarce and valuable book. One of the few references on the coins of the foes of the Crusades available.

60 pages; 5 plates. Paper—$4.00, Cloth—$6.00

ROBERT J. MYERS

Box 442, Lenox Hill Station, New York, N. Y. 10021

(*continued from page* 177)
(B.C. 3/2), and a queen is no doubt represented on the bronze coins of Gotarzes (A.C. 40/41—51). The king invariably wears the diadem or helmet, and usually a cuirass, and a necklace. The earring is also frequently worn. He is almost invariably represented as bearded, both on obverse and reverse. A peculiarity of many Parthian portrait-heads is the occurrence of a wart on the king's forehead or temple. It is first seen on the head of Orodes I, and afterwards on the head of his son Phraates IV. It is found on many later kings, so that it seems to have been regarded as a distinctive dynastic peculiarity, like the anchor which was supposed to appear by nature on the thigh of the genuine descendants of Seleucus Nikator. The wart, or rather tuft of hair, meeting between the brows, seen on Buddhistic monuments is to some extent parallel. In the case of Gotarzes, a lock of hair seems to take the place of the wart that characterizes his rival Vardanes I (A.C. 41/42-45.)

The sole reverse type of the drachms (except in the period of Mithradates I) is the familiar one of the seated bowman. Thus is represented Arsaces, the founder of the empire, seated to right holding in his hand a strung bow. After the reign of Mithradates II, the object on which he is seated is a throne with a back. But in the earlier drachms it is clearly the omphalos of Apollo, that conical stone at Delphi, which was supposed by the Greeks to be the centre of the world.

The bowman type was not placed upon the tetradrachms till the reign of Mithradates II and continued to be the constant type till the time of Orodes I, during the progress of whose reign new types began to make their appearance. Orodes I inaugurated a type, which with various modifications in detail, remains predominant throughout the whole tetradrachm series. This type represents the reigning king of Parthia, in state costume, seated on his throne and receiving homage from the Tyche of a Greek city.

The bronze coins present to us a multitude of types.

The drachms of several kings subsequent to Sinatruces (B. C. 77-70) are marked by numerous monograms and letters, the number of varieties being greatest under Orodes I. Chabouillet (*Revue Numismatique*, 1867, p. 392) says that there are but few cities, such as Odessus, Patrae and Panormus, which are known to have placed on their coins a monogram to represent their names and that in these cases the monogram was a sort of recognized symbol or arms of the town and not a mere invention of the die-sinker. He contends that these monograms are usually merely the private mark of a magistrate or con-

tractor and were not intended to be decipherable to any one except himself. Gardner (*The Parthian Coinage*, p. 23 sq.) says "To suppose that a monogram in the field of a coin usually represents the name of the mint whence it was issued, is to go altogether beyond the evidence. But even if they did contain the names of cities, it would be quite hopeless to attempt to read them, a monogram being a thing by nature most obscure and ambiguous. It can nearly always be read in three or four ways, and may often, by means of a little ingenuity, be made to represent anything the interpretor chooses." De Markoff (*Monnaies des rois parthes*, Part 2, p. 41 and plate) has compiled a table of 112 different monograms and letters and also a list containing the names of about the same number of towns which he supposes the monograms and letters to indicate. His identifications are mostly hypothetical, as most monograms can be read in more ways than one. From the appearance of several monograms for a long period it is certain that they cannot be the private marks or personal names of magistrates. The only possible view is to suppose that they indicate, in some way or other, the mint-place of the coins.

Even a superficial study of Parthian coins will bring to light the fact that they may be divided under every reign into two classes. The first class consists of tetradrachms, and a certain number of bronze coins, notably those bearing as type the figure or the head of a city. The second class consists of the drachms and obols, with the greater part of the bronze coinage. The coins of the first class exhibit more care and a higher civilization than those of the second. The types exhibit higher art, and show more variety of idea, and the inscriptions are notably written with far greater clearness and correctness. On the drachms the Greek letters after the reign of Phraates IV have become more crude, and from the reign of Gotarzes have been quite debased and unintelligible, being evidently executed by a die-sinker who could not read them. From the ordinary bronze coins all legends have disappeared, and are replaced by a mere square or circle of dots. But the tetradrachms, and those pieces of bronze which bear the head or figure of a city, can be read to the last, and were unquestionably produced in cities where the Greek tongue was by no means dead. This class of coins, too, bears, in all cases, dates according to the era of the Seleucid. The portrait is the only point in which the two series meet, and the notions of portraiture possessed by the artists of the tetradrachms differ entirely from those possessed by the artists of the drachms. Lindsay (*Coinage of the*

Parthians, pl. II) and De Markoff (*Monnaies des rois Parthes*, plate) have drawn up tabular lists of the many strange forms of letters found on Parthian coins. The Pahlavi letters which appear for the first time on the coins of Volagases I. are given by De Markoff (*p. cit.*) and Doruin (*Revue Archeologique*. vol. IV. 1884, pl. V). It is obvious. however. as Eckhel long ago observed, that in most cases the strange forms of letters are merely due to the blunders of a native workman ignorant of Greek. If the legends of the later drachms do not entirely lapse into barbarism (*i.e.* a meaningless combination of letters). it is because there is a sort of conscientiousness on the part of the engraver in coyping the coins of his predecessors. He furnishes at least an adumbration of the inscription intended. though he stereotypes correct and incorrect forms with complete impartiality.

NOTES

[1] Furdoonjee D. J. Paruck was the author of the standard reference work on Sassanian Coins published in Bombay in 1924. He published also a great number of papers on Indian and Oriental coins.

[2] Originally published by the authors in Bombay in the year 1919. A copy of this rare pamphlet is in the library of the ANS. According to the author's notation it was printed previously in the publication, "SANJ VARTAMAN" (Parsi New Year Number, Sept. 11, 1919).

[3] EDITOR'S NOTE: It is really interesting to note that the author does not mention the work of Alexander Wm. Petrowicz, *Arsakiden Munzen* published in 1904. This work, still considered as one of the main references on Parthian Coins, raised the problem of a reclassification of early Parthian coinage on the basis of new identification of some of the issues with the Parthian dynasty of Armenia.

NOTES FROM NORWAY

Whether you are interested in building up your collection of ancients or disposing of rarer pieces we perhaps can be of assistnce. Want lists solicited. A copy of our current free list on request.

DAVE AND SUE PERRY

BOX 631 **BERGEN, NORWAY**

IF YOU ARE MOVING, PLEASE ADVISE THE PUBLISHERS AS SOON AS POSSIBLE. THE "TURTLE" CANNOT BE FORWARDED.

Treatment of Leather Bookbinding

C. E. Rowe

Over the years I have accumulated a few numismatic books with fine leather bindings, in addition to having a few leather-bound books which were family possessions over the past 200 years. Since some of these show evidence of deterioration, I decided to look into methods of preservation.

This was not as easy one might think, unless one is close to libraries large enough to have valuable collections, and staffs who are competent to care for them. Some of my discussions revealed very complicated formulations for preserving leather, for which the ingredients are hard to find, and hard to combine.

I was finally referred by the bookbinding section of a major library to the pamphlet indicated below. Possibly other numismatists would wish to obtain this reference for use in preserving their own leather-bound volumes: *Leather Bookbindings: How to Preserve Them*, Leaflet No. 398, United States Department of Agriculture Washington, D.C. May, 1956, for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C., Price 5 cents.

This pamphlet gives *eight* formulas for the treatment of leather, and indicates some of the libraries which have used them. The library to which I referred uses Preparation No. 6, which is a simple combination of 60% neats-foot oil and 40% lanolin, melted together, and applied with a brush. This is the formula which I have used. It appeals to me as probably being as good as some more complicated formulas, although possibly not as permanent as those that contain bees-wax, or other solid waxes.

I would like to express the thought that there may be some obligation on the part of the collector to preserve old books, along with coins and other artifacts, as a part of our heritage. Many of the old publications will never be reprinted, so there will inevitably be fewer copies, rather than more. The thoughts contained in many of them are worth keeping in the record.

Our current notions of property rights give us the impression that we possess the things that we buy, and this is no doubt true for those that are consumed. For those things which we hope will endure, the purchase price might reasonably be looked upon as a long-term lease payment, society being the lessor. In a general way, the preservation of the property held

then becomes an obligation of the lessee. The economic stimulus to this thought is more apparent today with the inflated values of old artifacts, but it exists at any time, when irreplaceable objects are at stake.

In line with this thought, I have often expressed myself as opposed to the fashioning of ancient coins into jewelry. This practice allows a man to flatter his vanity by placing an object of value around the neck of his wife or sweetheart, but it removes from the public domain, present or potential an artifact from which present or future owners could derive knowledge and intellectual stimulation. We may all be the heirs of the past; we are also the testators of the future.

THE NUMISMATIC EXCHANGE

One insertion, per line..35 cents
Six months, per line.....$1.80
Mail replies: Box Number
c/o Argonaut, Inc.
737 N. Michigan Ave.
Chicago, Illinois 60611

Deadline: First of month preceding date of issue. Cash in advance. No stamps, please.

Send classified ads to: Lewis Henry, Business Manager, Argonaut, Inc., Publishers, 737 North Michigan Avenue, Chicago, Illinois 60611.

FOR SALE

ANCIENT GREEK & ROMAN coins for sale. Free Price Lists. F. J. Rath, P.O. Box 84, Youngstown, N.Y. 14174 (6)

ANCIENT ROMAN COINS. Many choice & rare. Send for free list today. Harold Whitmire, 450 Walnut Hts., Bluefield, W. Va. (7)

PRECISION SCALES. R. Braun, 2320 Cleveland, Chicago, Ill. (2)

WANTED

JUDAEA, Palestine, Israel. State condition and price. Jacob Cheris, P.O. Box 8537, Albany N.Y. 12208.

ALL ANCIENT Greek, Roman, Byzantine Coins. Claude Held, P.O. Box 140, Buffalo, N.Y. 14225 (6)

JUST RELEASED!

FIRST AMERICAN REPRINT

HISTORIA NUMORUM

By **BARCLAY V. HEAD**

$30.00 Postpaid

Full Dealers' Discounts Available

ARGONAUT INC., PUBLISHERS

737 N. MICHIGAN CHICAGO, ILL. 60611

Carson Pirie Scott & co

A NEW ADVERTISER IN THE TURTLE

Dear TURTLE Readers:

We at Carson's would like to be able to sell more coins of true historical and numismatic significance, and fewer die varieties of 1965 Jefferson nickels. We hope that our readers will want to buy the foreign and ancient coins we'll be offering in these pages during the next few months; we believe them to be desirable specimens, fairly graded and priced.

Athens: AR Tetradrachm, ca. 490-430 B.C. Athena/Owl Seaby #984; A choice VF-EF specimen of good style, but cleaned once.....$125.00

Ephesus: AR Drachm, prior to 480 B.C.—Bee/Quadripartite Incuse Square —VG-Fine, grainy surface, cleaned once.....$17.50

Carthage: AR Tetradrachm, ca. 410-310 B.C.—Horse's head facing left, date palm behind, punic inscr. in exergue/Young Herakles fac. right; Seaby # 2957. A splendid VF+ specimen of lovely style $275.00

Thebes: AR Stater, ca. 395-387 B.C.—Boeotian shield (off-center)/Amphora cluster of grapes to left; A very attractive EF $100.00

Sicyonia: AR Hemidrachm, ca. 400-300 B.C.—Chimaera/Dove—Seaby #1110; An attractive F-VF specimen.....$15.00

Rome: AR Denarius of L. Procilius, ca. 78-77 B.C.—Head of Juno Sospita, **S.C.** behind/Juno in biga—**Procilia** 2; a pleasing VF.....$15.00

Rome: AR Denarius of Julius Caesar—Head of Venus, right (banker's marks on left edge), 20% off-center/Aneas carrying Anchises and Palladium—#12 in Seaby's **Roman Silver Coins;** Fine to Very Fine... $47.50

Rome: AR Denarius of Galba, ca. 68-69 A.D.—high-relief portrait facing right/**SPQR OB C S** within wreath—R.S.C. #287; A superb EF, $150.00

Byzantine Empire: AV Scyphate Nomisma of Michael VII, Ducas, ca. 1071-1078 A.D.—Bust of Emperor, facing, holding labarum/Christ with pointed beard, **IC XC** in field. Goodacre 2; A superb FDC specimen, $90.00

—Postage appreciated, as are want lists. Come in and visit us when in Chicago:

CARSON, PIRIE SCOTT & CO.

1 SOUTH STATE STREET, CHICAGO, ILL. 60603

Dept. L-764—Please direct your orders to the attention of Mr. John L. Barton, our specialist in Classical Numismatics.

NOW AVAILABLE FROM ARGONAUT

THE BOOK WHICH HAS BECOME THE BASIC REFERENCE FOR NUMISMATIC RESEARCH TODAY

Select Numismatic Bibliography

by ELVIRA CLAIN-STEFANELLI

Associate Curator of Numismatics in the Smithsonian Institution, Washington, D.C.

Highly praised in all numismatic journals and periodicals throughout the world, the Select Numismatic Bibliography is considered to be the cornerstone of any numismatic library. Contains 4962 listings of reference books and important articles of which 2282 are devoted to ancient and mediaeval numismatics. This book is of fundamental importance to the development of numismatic study and scholarship.

pp. xiv + 406 . . . . . $12.50

A special offer to members of the Ancient Coin Club of America and subscribers of the "Turtle."

You may obtain the Select Numismatic Bibliography for $10.00 postpaid until July 31, 1967. Check or money order must accompany your order. This special offer is limited to a maximum of two copies per member. For readers overseas, this offer will remain in force for 15 days after delivery of this issue.

ARGONAUT INC. Publishers

737 N. Michigan Avenue

Chicago, Illinois 60611